News Releases

Turning the Table on Mosquitos –Navy Researchers Infect Mosquitos with Malaria to Mass Produce Critical Reagents

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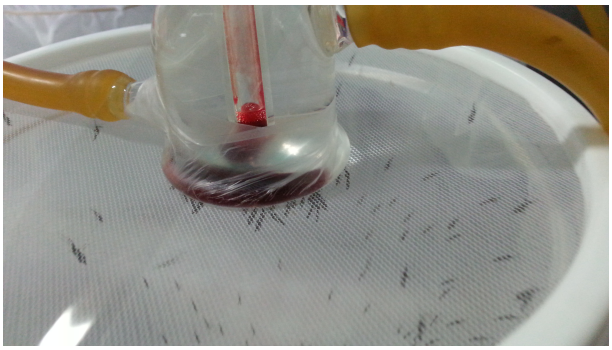

A colony of Anopheles darling mosquitos at the NAMRU-6 Insectary feeds on inflected blood

PERU – The Entomology Department at the U.S. Naval Medical Research Unit No. 6 (NAMRU-6) in Lima, Peru, developed a highly productive, self-mating, sustainable breeding colony of *Anopheles darling* mosquitos at the laboratory's insectary. In collaboration with the NAMRU-6 Parasitology Department, researchers turned the tables on the mosquitos, and use blood-meals to infect mosquitos with malaria.

Researchers take blood from patients infected with the malaria parasite, *Plasmodium vivax,* and feed it to uninfected female *Anopheles darling* mosquitos. In a controlled laboratory setting, the malaria infected blood is fed to the mosquitos through a membrane feeding system.

P.vivax, unlike other malarial parasites, cannot be grown in a culture; so blood from malaria patients has to be used in this feeding system. Additionally, the *P. vivax* parasites will only reproduce inside mosquitos, and this female mosquito feeding system is the only way to produce large amounts of a particular developmental stage of the disease, known as sporozoites. Developing large amounts of *P. vivax* sporozoites is critical for vaccine development and anti-malaria drug testing.

"Minding the logistical constraints, our team was able to establish a new system for *P. vivax* sporozoite production in the Peruvian Amazon, a unique, valuable Navy resource for *vivax* malaria research," said Dr. Gissella Vasquez, researcher, NAMRU-6.

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NAMRU-6 Entomology has gradually optimized the system and increased the average per-mosquito yield from approximately 1,000 to over 15,000 sporozoites. In 2016, this system produced 50 million *P. vivax* sporozoites using 27,000 mosquitos to support *vivax* malaria vaccine studies. Steady mosquito availability and year-round access to *P. vivax* blood-donors in the same location, makes the NAMRU-6 *P. vivax* sporozoite production system a valuable resource for basic and applied research in support of the Department of Defense Malaria Vaccine initiative.

"Establishment of this new *P. vivax* sporozoite system is a remarkable achievement based on tireless dedication, exceptional teamwork, and passionate commitment from amazing group of people," said Vasquez.

Malaria, a mosquito-borne parasitic disease, if left untreated can lead to severe illness and sometimes death. According to the latest World Health Organization (WHO) estimates,there were 212 million cases of malaria in 2015 and 429,000 deaths.

P. vivax is the dominant malaria parasite in most countries outside of sub-Saharan Africa. About 1,500 cases of malaria are diagnosed in the United States each year. The vast majority of cases in the United States occur in travelers and immigrants returning from countries where malaria transmission occurs, many from sub-Saharan Africa, South America and South Asia. Malaria remains a significant financial and readiness burden for U.S. military and allied forces.

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